

National Aeronautics and Space Administration

COMMERCIAL ADVISORY SUBCOMMITTEE

OF THE

BIOLOGICAL AND PHYSICAL RESEARCH
ADVISORY COMMITTEE

October 22, 2003
NASA Headquarters
Washington, D.C.

MEETING REPORT

Dr. Lance Bush
Executive Secretary

Ms. Elsa Porter
Chair

COMMERCIAL ADVISORY SUBCOMMITTEE (CAS)

October 22, 2003
NASA Headquarters
Washington, D.C.

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COMMERCIAL ADVISORY SUBCOMMITTEE (CAS)

October 22, 2003
NASA Headquarters
Washington, D.C.

Welcome, Introduction, and Opening Remarks

Ms. Elsa Porter, chair of the Commercial Advisory Subcommittee (CAS) opened the meeting and asked the members and guests to introduce themselves.

Report from the Biological and Physical Research Advisory Committee (BPRAC)

Ms. Porter reported on the latest meeting of the BPRAC, which was a workshop in May 2003 on the strategic plan for the Office of Biological and Physical Research (OBPR). The resulting strategic plan has been distributed and is available in PDF format on line at <http://spaceresearch.nasa.gov/docs/OBPRStrategy.pdf>. The BPRAC also participated in a telephone conference call with the OBPR Associate Administrator, Ms. Mary Kicza, and other OBPR staff to discuss the future of the OBPR advisory committees, including the CAS. BPRAC members were asked to submit names for candidates to serve on the main committee and its subcommittees. One important issue addressed concerned the future of the Space Station Utilization Advisory Committee (SSUAS). Subsequently, both Ms. Porter and Dr. Ray Bula, who also serves with Ms. Porter on the BPRAC, have recommended that the SSUAS continue at least until the International Space Station Research Institute (ISSRI) becomes operational.

Dr. Bula described his suggestions to Ms. Kicza during the conference call on the advisory committee structure. He had agreed that the advisory structure could be structured to reflect the OBPR organizing questions, with questions 1 and 4 addressed by one subcommittee on space exploration, but question 3 should be split into parts, on basic physical questions (fundamental physical science) and the second on the quality of life on Earth. The quality of life on Earth should be the purview of the CAS (or its successor subcommittee). He had also suggested the possibility of combining the current physical sciences and life sciences subcommittees into one, as the scope of the physical science question is the impact of physical conditions on life processes, as well as impact on physical processes. Dr. Bula added that a great deal of work will be needed before the ISSRI is functional.

Ms. Porter said that this CAS meeting will be her last as a subcommittee member, after serving six years.

Report from the SSUAS

Dr. Tony Overfelt described the latest meeting of the SSUAS, which included presentations about International Space Station (ISS) hardware and discussions on the future role of the SSUAS. A number of departures were announced, among both committee members and NASA staff.

The CAS discussed the current status of the SSUAS, where it reports within the NASA organizational structure, and its ongoing value to ISS planning. The members agreed that the CAS should make a recommendation on the SSUAS in its report to the BPRAC.

Director's Update on the Space Product Development Division (SPD)

At Ms. Porter's request, Dr. Frank Schowengerdt, Director of the SPD, began with an update on issues remaining from the April 2003 CAS meeting. A working group from Headquarters, JSC, and MSFC has developed a uniform set of rules for deciding payload allocation and manifesting for flights to the ISS. This single set of rules is meant to apply across all of NASA and to accommodate differences in roles and missions, such as those specific to the SPD. A strawman test run of the rules, using an internal evaluation board, was conducted about six weeks ago. The decision rules are still being discussed within NASA. Dr. Schowengerdt believes that SPD payloads will fare well under the new evaluation procedure, if SPD follows its own payload selection process.

Mr. John Emond of the SPD staff, who attended the evaluation board meeting, described it as a dry run to test the strengths and weaknesses of the process. It did show that participants on the board bring their own perspectives on the value of program missions, so the composition and balance of the board will be important. The participants on this test board are not currently directly involved with any of the programs being considered, but several had past experience with SPD or other programs presenting payloads for evaluation. The process needs to be clarified and monitored to ensure that decisions are made on the basis of the written statements on candidate payload. Otherwise, evaluations can be swayed by participants' outside knowledge of and interest in specific programs or projects. The statements on SPD payloads also must be clear and complete, without gaps in addressing the decision criteria. Of the 26 proposed payloads evaluated, SPD had three of the top-ranked five and seven of the top ten, before the weighting for flight readiness, strategic planning, terrestrial benefits, etc. With these weighting factors added, SPD had four of the top five and seven of the top ten. Mr. Emond views the test run as showing that SPD can do well in the evaluation, but the information provided on payloads can be done better. No manifest decisions will be made on the basis of this test run, but the next round will decide on real payloads.

Mr. Sherwood Anderson commented that strategic value to NASA now was the highest priority criterion. Commercial projects were rated higher on that criterion, with fundamental research ranked lowest. This meant that SPD payloads did well in this run, but a change in the wording of the criterion on strategic value could drastically alter the rankings. The participation of commercial partners on the SPD projects also helped them in the evaluation. The CAS and guests discussed the stability of the evaluation criteria and whether commercial projects would still be bumped from payload allocations, as they have been in the past despite high evaluations. The selection of board members from outside NASA for the operational evaluation process was discussed. The evaluation program will reside in the Office of the Chief Scientist for ISS, who reports to Mary Kicza.

At the April CAS meeting, Dr. Schowengerdt suggested that “Space Partnership Division” would be a more appropriate name for SPD, and the CAS concurred. Ms. Kicza is also in favor of the change, but it is being reviewed at higher levels in NASA. Until the review is complete, the existing name, Space Product Development Division, will be used.

Dr. Schowengerdt described his work with the directors of the 15 research partnership centers (RPCs) during the summer on a plan for moving the SPD forward. The RPCs now have 157 industrial partners. With respect to outcome measures, the centers produced 288 publications in fiscal year (FY) 2002, of which 188 were in refereed journals. When publications or degrees awarded (graduate or undergraduate) are compared, relative to division funding from NASA, SPD comes out ahead of other OBPR divisions by a factor of 5. The FY 2002 resources for the RPCs, including cash and in-kind resources, totaled \$97.6 million, of which \$29.3 million was SPD funding, a leveraging ratio of 2.29. Eight industry-partnered payloads were flown during FY 2002. Spaceflight hardware developed at the RPCs has been used by industry and the NASA Centers outside MSFC, as well as by the RPCs and their partners.

Dr. Schowengerdt reviewed the payloads on orbit on the ISS and those scheduled to fly. The Commercial Generic Bioprocessing Apparatus is supporting a crystallization experiment sponsored by the Japanese Aerospace Exploration Agency (JAXA). The Zeolite Crystal Growth (ZCG) furnace is awaiting samples to be sent on the 14 Progress flight. The support system for the Advanced ASTROCULTURE™ (ADVASC) growth chamber is on orbit, with the growth chamber still to be flown to the ISS. The StarNav Star Tracker system was flown through a SPACEHAB allocation, separate from the OBPR payload allocations.

The Space-DRUMS™ payload, an acoustic levitation and containerless processing system, is now at KSC awaiting a Shuttle carrying utilization payloads. Dr. Schowengerdt and CAS members discussed the industry funding for Space-DRUMS, its utility for solid-state combustion experiments (such as in synthesis of ceramics and metal-matrix composites), and the cost consequences of the Shuttle stand-down. Bioserve Space Technologies and the Center for Biophysical Sciences and Engineering (CBSE) also have payloads scheduled for delivery to the ISS. Dr. Schowengerdt described the five RPC experiments that flew on STS-107, noting that most of the experimental data were recovered prior to the loss of that Shuttle (*Columbia*). He described the significant results obtained from the Water Mist Fire Suppression experiment. The results, which would not have been observable in an environment of normal gravity, will lead to continued work aimed at fire-suppression applications on NASA spacecraft. CBSE will be a partner in a multi-university consortium with industry and the government as a Center of Excellence for Biological Threats. Another RPC technical achievement is the casting of magnesium components using a vacuum sealed molding process developed by the Solidification Design Center at Auburn University. The Medical Informatics Technology Application Center (MITAC) has been awarded two grants from the Department of Defense (DoD) for telemedicine developments, which complement NASA's needs.

Dr. Schowengerdt described other initiatives in progress and proposals that have been submitted by the RPCs to NASA Centers and in response to NASA Research Announcements (NRAs). Given the funding cutback facing the division in 2005 and the resistance to increased funding for long-established programs, he suggested that SPD needs to look for something new, rather than relying on what has proven successful before. He has asked the RPC directors to work on five or six new initiatives, involving partnering among the RPCs, that would be of interest to the other OBPR divisions, other offices in NASA, and even other federal agencies. These initiatives should be in the \$20–30 million range, not a few hundred thousand dollars each.

Among Dr. Schowengerdt's issues and concerns are the delays on the EXPRESS pallet for testing spaceflight hardware outside the ISS, the consequences for commercial access to space of a prolonged period before Shuttle Return to Flight, and the proposed budget cuts to SPD beginning in FY 2005. The FY 2004 budget allocations for the RPCs, which were sent out in September, contain cuts of 5 percent to 27 percent from base funding requests. Total RPC funding from NASA is down 11 percent from FY 2003. The FY 2005 amounts in the President's budget submission cut the SPD budget by two-thirds. At that level, Dr. Schowengerdt said, there would be no program to realign with NASA strategic priorities. Industrial partners will pull out. If that occurs, the utilization of the ISS and of Shuttle mid-deck lockers will decrease significantly. He believes that SPD and the RPCs need to look for opportunities and pursue them. The SPD workshop in Golden, Colorado, in May 2003 was the first step in developing a plan to do this. Over the summer, SPD has developed its own strategic plan, which is consistent with and supports the OBPR strategy. The CAS discussed ways of communicating the message about the commercial effectiveness of SPD and the RPCs to Congress, as well as within NASA and the Administration. Also discussed were congressional interest in whether unmanned flights could suffice for many payloads planned for the Shuttle or ISS and the status of a possible \$200 million cut in the FY 2004 appropriation for the ISS from FY 2003.

Dr. Schowengerdt described common misperceptions within NASA and the Administration of how the RPCs interact with their industry partners. He has had to explain that the RPCs do research, not commercialization. The industry partners who participate in the research do the commercialization. Rather than the RPCs choosing which industry partners with which to work ("choosing winners"), the partners choose to work with an RPC to leverage their capabilities and resources with those of the center. The resulting leveraging of NASA funds by a factor of two or more is not understood. He described how the cost of access to space represents a market failure that the RPC program addresses, in conformity with guidelines from the Office of Management and Budget (OMB) and the Office of Science and Technology Policy (OSTP). When the commercial space centers (the former name for RPCs) were first established, they were intended to be the main vehicle for economic development of Earth-orbital space, which the Commercial Space Act of 1997 states as a primary goal of that legislation.

Dr. Schowengerdt reviewed the history of RPC selections, external reviews, and closings since the program began in 1985. He then presented his analysis of how a representative

set of RPC projects support the first four of the five OBPR Organizing Questions. With respect to the fifth question, "How can we educate and inspire the next generation to take the journey?" the university location, student involvement, and outreach programs of the RPCs make this one of SPD's strongest points in meeting OBPR objectives. In response to a CAS question about the possibility of an education-directed initiative for the RPCs, Dr. Schowengerdt said that, with the new Office of Education (Code N) in its start-up phase, NASA support for an SPD education program could not reasonably be expected. Another strength of SPD is its potential for linking with other NASA enterprises via the NASA Space Architecture. Many of the RPC projects have potential in developing dual-use technologies, with both commercial and NASA-strategic applications. Dr. Schowengerdt noted the strengths of the RPC program with respect to various mission statements and objectives for NASA. He presented the SPD mission statement, goals, and objectives included in the SPD plan and described the road map for realigning the program with NASA needs. A new set of metrics, which were discussed at the May workshop, will be used to evaluate the RPCs and decide on SPD funding allocations. The SPD performance plan outcomes for FY 2004 are to (1) realign commercial product development to focus on NASA needs, while maintaining industrial partnerships; (2) develop and test at least two design tools for advanced materials and in-space fabrication, to be validated on the ISS; and (3) work with other OBPR divisions and NASA enterprises to identify at least three additional users of RPC spaceflight hardware.

Dr. Schowengerdt concluded with his funding projections for the RPCs through FY 2009, based on the projected SPD funding reductions and the funding anticipated from other sources. He compared this profile with projections assuming stable SPD funding at the full funding level requested for FY 2004. In summary, he said, the program is at a crossroads. However, there is no fundamental conflict between the legacy of accomplishment in moving everyday business into space to benefit society and the new direction to focus on NASA's purposes. These roles can enrich each other, with new opportunities arising where they intersect. He sees SPD becoming an even more valuable resource to OBPR, NASA, and the nation in the future.

Status Update on the HDMAX Space Camera System

Mr. Sherwood Anderson of the SPD staff at MSFC briefed the CAS on HDMAX progress since the April 2003 meeting. In addition to the objective of demonstrating the value of the camera system for NASA applications, the HDMAX project has the objective of stimulating U.S. commercial development and applications of advanced digital video camera technology. Phase I is in progress. For Phase II, an industry partner is needed before the effort on an external, arm-mounted space camera can begin. A change in the Quad HD camera design since April is the addition of water cooling to the camera base station, to supplement the air cooling in removing waste heat. The camera sensor board, which is a commercial product, uses CMOS technology. It provides a high signal-to-noise ratio and radiation resistance. In a recent test, only 8 of the 8 million pixels in the detector were bad after radiation exposure. The uniqueness of the HDMAX system is in the software for image compression. For ISS storage, the base station will occupy one powered EXPRESS rack locker. Three additional lockers will be used for storing the camera, lights, and other equipment. The camera dimensions have increased

somewhat, the weight has increased by 25 percent, and the power required has increased from 20 to 30 W. The camera sensitivity has been tested at ASA 800, compared with a design estimate of ASA 200 during design. If the filter to capture the visible-light spectrum is removed, the monochrome-mode is ASA 2000. This increase in sensitivity means that the number of lights can be decreased from four to two. One hour of video and audio recording prior to compression can be stored. In answer to a CAS question, Mr. Anderson said there will be negligible information loss from the data compression. An SDTV output will be compressed for transmission to the ground for real-time viewing and management of the on-orbit shooting. In reviewing the rationale for the shoot model to be used in Phase I (shots will be set up and designed as in a motion-picture film), Mr. Anderson stressed the importance of setting up the scene prior to the shot. The commercial partners on the project will pay for shots that can be used as 60-second trailers in commercial movie theaters. The full-length video feature that was initially discussed is no longer part of the Phase I plan.

The proposed NASA utilization of HDMAX includes a guest investigator program, in which approved research or studies can use the camera system to help meet their stated objectives. The research project must provide its own ISS-based resources, recording media, and any special recording equipment (e.g., special lenses). It must also manifest the necessary equipment for delivery to the ISS. Six NASA research programs sent representatives to the HDMAX users' meeting this summer. Other NASA uses that are being explored include external inspections related to Shuttle Return to Flight, the Shuttle Life Extension Program, and ISS maintenance and trouble-shooting.

Results from the Independent External Review of SPD and the RPCs

Mr. Mark Nall, SPD Program Director at MSFC, briefed the CAS on the external program review in progress by Booz-Allen Hamilton (BAH). On August 28, BAH reported on its review of the first ten of the RPCs. BAH had reported previously on the overall SPD program and has concurred with the approach of using output measures normalized to the level of program inputs (output per unit of funding). The overall report on the program described it as "impressive by any standard." The review results will be presented to Ms. Kicza on October 30. The CAS and guests discussed comments by Dr. Bula and Dr. Tony Overfelt on the need to publicize the quantitative measures of SPD output effectiveness more widely, particularly with those involved in funding decisions that affect SPD and the RPCs.

Mr. Nall highlighted comments and recommendation from the BAH interim reports. One comment was that, within the space commercialization environment, the RPCs play a significant role, providing a centrally focused and mutually beneficial avenue in which companies, universities, and government agencies can collaborate to create new innovations that enhance life in space and on earth. The April report on the program recommended that the observations and recommendations from the earlier reviews by the National Academy of Public Administration (NAPA) need to be accelerated by both the RPCs and NASA. It also recommended increased funding for SPD to help accomplish the proactive management, outreach, and marketing of the RPCs. A criticism was that the program does not appear to be reaching the right people in NASA to make its case for

support. The report noted complaints from RPC directors on the time and effort required to ensure appropriate and continued levels of funding from NASA and Congress. Another issue for the RPC directors was excessive documentation required by NASA. Communications with the universities that host the RPCs need to be improved. Overall, Mr. Nall said, the themes of the report were to emphasize communication, improve the advocacy for the program, and streamline requirements and documentation.

With respect to the earlier NAPA review, Ms. Porter noted that it was released three years ago but not much has been done to implement its recommendations. In response to a question from Dr. Bula, Mr. Nall said that BAH had not been tasked with reviewing the quality of the research conducted at the RPCs. This led to a CAS discussion of the role of peer review and evaluation of research quality in RPC activity. Ms. Porter asked whether congressional committees deciding on FY 2004 appropriations had had access to the BAH reports or their findings and recommendations. Mr. Nall replied that some congressional staff had been aware of the reports' contents. Ms. Porter requested that the SPD distribute the BAH reports to the CAS members.

SPD Budget Detail

Dr. Schowengerdt presented SPD budget details related to the way in which NASA's line item for Multi-User Systems and Support (MUSS) and the Alpha Magnetic Spectrometer (AMS) inflate the apparent SPD funding levels. (This issue had been discussed at the April 2003 CAS meeting.) For example, of the \$261 million in the Research Partnerships and Flight Support budget line for FY 2004, \$212 million is for MUSS. Of the remaining \$48.7 million listed as Space Product Development, \$16.9 million is for Mission Integration, \$18.8 million is for ISS operation, and only \$13 million is for RPC support. Dr. Schowengerdt noted that the FY 2005 plan of \$7.7 million (in full-cost accounting, or \$5.8 million in purchase power equivalent) for RPC support will provide funding for only about five of the fifteen RPCs. The CAS and SPD staff present discussed the history of the budget breakout and which of the other items in the Research Partnerships and Flight Support line might include any indirect support to RPC payloads on the ISS or Shuttle. The CAS concurred with Ms. Porter on the need to reiterate emphatically the CAS recommendation from the April 2003 meeting that the current organization of the budget is misleading with respect to the funding of SPD and should be clarified.

Lunch Discussion: Russian Center for Cultural and Scientific Cooperation

During the lunch break, CAS member Mr. Larry Austin described his recent visit to the Russian Center for Cultural and Scientific Cooperation, where he spoke with its vice president. The Center, which is facing a decline or cutoff in funding from the Russian government, wants to publicize its technology that is commercializable in the near term. It is interested in establishing a clearinghouse for academic papers and other open information on spaceflight technology and related technological developments. The Center plans to open an office in Washington soon and is interested in developing a working relationship with SPD and the CAS. CAS members and SPD staff discussed how a connection with this Russian center could increase the technology base offered to RPC industry partners and NASA. Dr. Schowengerdt is on the board of an entity with a similar role with respect to Japanese technology. Mr. Austin also said that the Chinese, who are

excited about their nation's recent achievement of a human space flight, may also be interested in this kind of cooperation on technology commercialization. Dr. Bula noted that such efforts are particularly germane to NASA goals of demonstrating the value of space research for improving life on Earth.

ISS Research Institute

Mr. Emond provided an update on activities related to establishing an ISS Research Institute (ISSRI). The draft Statement of Work (SOW) is available, and Mr. Emond discussed sections of the SOW of particular relevance to the SPD and the CAS. (The SOW is available on line at spaceresearch.nasa.gov/research_projects/ngo.html.) Section G.1 describes the ISSRI role in early concept development for new commercial initiatives. Section G.2 provides for a merit evaluation of commercial research candidates for the ISS. This section provides the charter for an independent board to evaluate opportunities with a single set of criteria, replacing the current differences in selection criteria in use by different NASA entities (e.g., the NASA Centers and SPD). The evaluation board's recommendations will go to NASA, which will make the final decision. The two-stage review (evaluation board, then NASA) will replace the current SPD procedure, which has an SPD/MSFC review followed by application of decision rules. It adds an element of external, independent review to decisions on commercial payloads. Funding for ISSRI will come from the OBPR budget. Section G.3 describes the ISSRI role in providing feedback to partnerships with industrial, academic, and government entities. Section G.4 describes market development analysis to be done by the institute.

The CAS discussed the extent of authority and control the ISSRI will have across the range of its activities. Other discussion topics were the way in which the ISSRI roles might develop and what the subcommittee will report to the BPRAC in response to the draft SOW. The subcommittee also discussed the ISSRI guest investigator program and how it would fit with existing programs for reuse of available hardware and facilities.

Subcommittee Restructuring and Future of SSUAS

Dr. Schowengerdt summarized the current advisory committee structure for OBPR and Ms. Kicza's interest in how it might be restructured along the lines of OBPR's five organizing questions. The restructuring would make subcommittees of the BPRAC more multidisciplinary than some are now. CAS members and guests discussed options related to maintaining an advisory function for SPD, the importance to SPD of Organizing Question 3, and alternative ways of restructuring the advisory structure to cover the OBPR themes. With respect to the SSUAS, the members agreed that its advisory functions on ISS utilization should be maintained, in part because the advisory role of the ISSRI to the BPRAC appears tenuous. Having CAS members jointly serving on one of the other BPRAC subcommittees was discussed as a strategy for providing a knowledgeable perspective on commercialization relevant to each of the OBPR organizing questions.

It was noted that the current terms of reference for the CAS expire in October 2003. The committee recommended that the terms of reference be renewed, although the name of

the committee should be updated to reflect the change in name of the NASA division and program concerning which it provides findings and recommendations to the BPRAC for action. To that end, the committee agreed to a change of name to the Research Partnership Subcommittee.

Committee Discussion

The CAS continued discussing the advisory committee structure for OBPR, the role and structure of the CAS, the role of the SSUAS, the CAS response to the draft ISSRI SOW, the impact of outyear budget plans on SPD and the RPCs, and consequences for ISS utilization if the RPCs cease to develop payloads. The CAS agreed with Dr.

Schowengerdt's concerns that a reorganization of the advisory structure could leave the commercialization program without a knowledgeable center of influence in the advisory structure and that the CAS or a similarly focused entity should continue. Dr.

Schowengerdt described how the knowledge mapping activity by MacroVue® could be useful in representing the complex relationships and dependencies across OBPR programs. Ms. Porter suggested that members of the CAS could be appointed to other subcommittees, to provide a perspective on applications and commercialization. The CAS agreed with Dr. Overfelt's comment that the codification in law of a goal of commercial activity in space justifies an advisory entity, like the CAS, with a focus on commercialization.

The CAS agreed to recommend interdisciplinary representation on all the OBPR advisory committees. Organizing question 3 should be separated into two questions. A member with commercial applications experience should be appointed to each of the committees. The CAS or a similar entity should continue at least until the current budget crisis for the commercialization program is resolved (for the next three years). Each of the other subcommittees should have some members with commercialization background. The CAS discussed and approved expansion of the CAS membership and appointment of additional CAS members to the BPRAC and SSUAS. Ms. Porter asked the members to provide Dr. Schowengerdt with suggestions for additional CAS members (names and contact information). She said that RPC directors with expertise in a discipline would be good candidates for members on the BPRAC discipline-oriented subcommittees.

The CAS agreed that the SSUAS, or a similarly tasked entity, should continued at least until the ISSRI is clearly able to fulfill the functions now played by the SSUAS. The ISSRI SOW does not establish the advisory relation to the BPRAC that SSUAS has, with respect to reporting on ISS operations and utilization impacts. The CAS should be represented on the SSUAS or whatever replaces it. Dr. Bula's draft statement responding to the SOW was reviewed and approved by the subcommittee.

The CAS agreed to express concern that the current funding plans for the commercialization program leave it with too few resources to be effective in FY 2005 and beyond. The current representation of SPD funding in the budget is misleading as to the actual resources available to the SPD and the commercialization program. Dr. Spaulding emphasized that the major decisions about funding occur at the congressional level. Therefore, Congress needs to be informed about the contributions being made by

the RPCs to improving the quality of life on Earth and the leveraging of SPD funding for the RPCs through partners' cash and in-kind investments.

Ms. Kicza visited the meeting at about 3:30 p.m. and joined in the discussion. She reported being asked by congressional staff for additional information on the RPCs and the history of the program, including independent reviews that had occurred and the procedures for starting and closing RPCs. Ms. Porter summarized for Ms. Kicza the topics that had been addressed during the meeting and the issues raised by them. Ms. Kicza explained her perspective on some of the provisions in the ISSRI SOW, such as the guest investigator program. She discussed with CAS members the prospects for attracting senior research talent to the ISSRI if their workload in program administration is significant relative to their research time. Ms. Porter expressed the CAS concerns about the implications of a sharp decline in support for the RPC program, including the potential decline in ISS utilization without RPC payloads. The CAS also discussed with Ms. Kicza the results from the trial evaluation panel for prioritizing OBPR payloads to the ISS.

Wrap-up and Recommendations

Dr. Schowengerdt thanked Ms. Porter, on behalf of OBPR and SPD staff, for her years of service on the CAS and BPRAC and her contributions over the years in space-related commercial development. He also asked the members to provide suggestions of appropriate candidates for membership on the CAS.

The CAS agreed on passing the following findings and recommendations to the BPRAC.

1. The statutory goal of commercial activity in near-Earth space provides fundamental justification for an entity advising the OBPR Associate Administrator or the BPRAC on commercialization opportunities and commercial applications in space.
 - CAS membership should be expanded to nine members.
 - Additional members of the expanded CAS should be appointed to the BPRAC and SSUAS (up to three CAS members on each).
2. The CAS recommends that its charter (terms of reference) be renewed. The new terms of reference should be updated to reflect the change in name of the NASA division and program concerning which it provides advice and recommendations to the BRPAC. To that end, the members have agreed to "Research Partnership Subcommittee" as an appropriate name.
3. The current funding plans for the commercialization program leave it with too few resources to be effective in FY 2005 and beyond. The CAS concurs with the judgment of the SPD Director that the planned reductions for FY 2005 will effectively terminate the RPCs.

- Congress needs to be informed about the contributions being made by the RPCs to improving the quality of life on Earth and the leveraging of SPD funding for the RPCs through partners' cash and in-kind investments.
 - The impact of the loss of RPC payloads on ISS utilization should be assessed, if the current plan for the SPD budget in FY 2005 is retained.
4. The CAS supports the approach of reorganizing the BPRAC subcommittee structure to reflect the OBPR organizing questions. However, the CAS also believes that an advisory focus on the SPD should be maintained, at least until the fate of the RPC program is resolved.
 - The CAS should therefore be continued until the current crisis is resolved. One way to align the CAS (or similarly constituted subcommittee) with the organizing questions is to recognize that Question 3 covers two areas, one related to fundamental understanding of the universe, the second related to enriching life on Earth. The second area could become the focus for the CAS or a CAS-like subcommittee of the BPRAC.
 - All subcommittees should be balanced in representing both research and applications (including commercial applications), as well as being interdisciplinary.
 5. The CAS agrees with the draft of the ISSRI Statement of Work dealing with Research Partnerships (Section G). The CAS expresses concern regarding the following aspects of the draft of the ISSRI Statement of Work:
 - The implied emphasis on the research component of the ISSRI as indicated by the stated average value of 50 percent of the ISSRI staff being engaged in research rather than what was originally proposed for the ISSRI, which was to support the ISS utilization for all NASA Enterprises.
 - The emphasis on development of a Guest Investigator program (Section K).
 6. The CAS supports continuation of the SSUAS at least until the ISSRI becomes operational and can fulfill the advisory and informational role to the BPRAC that the SSUAS now provides. The CAS is concerned that the ISSRI, as specified in the draft Statement of Work, will not substitute adequately for the SSUAS.
 7. After reviewing the details of the budget structure that provides funding for SPD, the CAS remains concerned about the confusion caused by including unrelated budget items, such as the MUSS and AMS, within budget headings that appear to be funding SPD. The CAS iterates its recommendation from the April 2003 meeting that the budget organization be changed, or the heading descriptors rewritten, to clarify what is and what is not within the control of the SPD Division and the commercialization program.

8. The CAS was pleased with the results from the trial ISS payload evaluation panel and the process through which the payload evaluation decision rules were applied. This trial run illustrates the importance of appointing members for the real panel who are disinterested with respect to the different types of payloads brought before the board. There should also be a balance on the panel between members with primarily a research background and others, such as vice presidents of research in technology companies, with both scientific expertise and knowledge of the commercial world.

The meeting adjourned at 4:40 p.m.

Meeting of the Commercial Advisory Subcommittee
NASA Headquarters
October 22, 2003

9:00 am	Welcome	Ms. Porter
9:15	Report from the BPRAC	Ms. Porter
9:30	Report from the SSUAS	Dr. Spaulding Dr. Overfelt
9:45	Introduction/Remarks	Dr. Schowengerdt
	β SPD Development Plan	
	β Realignment Plans and Progress	
	β Legislative Issues/Research	
	Re-planning Activities	
11:00	Independent Review Results (Discussion of ISSRI)	
12:00 noon	Lunch	
1:00 p.m.	Subcommittee Restructure	
	β Organizing elements, schemes, Disciplines	
	β Terms of Reference	
	β Membership	
3:00	Future of SSUAS	Ms. Porter
3:30	Committee Discussions	
4:30	Wrap-up/Recommendations	Ms. Porter
5:00	Meeting Adjourn	

**National Aeronautics and Space Administration
Commercial Advisory Subcommittee
of the
Biological and Physical Research Advisory Committee**

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COMMERCIAL ADVISORY SUBCOMMITTEE (CAS)

October 22, 2003
NASA Headquarters
Washington, D.C.

MEETING ATTENDEES

Subcommittee Members:

Porter, Elsa A. <i>Chairperson</i>	Management Consultant
Austin, Larry	Starwalker Group
Bula, Raymond	AgSpace Technologies International, LLC
Spaulding, Glenn	Spindiagnosics
Overfelt, Tony	Solidification Design Center, Auburn University

NASA Attendees:

Anderson, Sherwood H.	Marshall Space Flight Center
Bush, Lance	Headquarters, Code US
Emond, John	Headquarters, Code US
Livingston, Candace	Headquarters, Code US
McGinley, Stephen	Headquarters, Code Z
Nall, Mark	Marshall Space Flight Center
Schowengerdt, Frank	Headquarters, Code US

Other Attendees:

Askew, Ray	Texas A&M University
Bardos, Russ	SPACEHAB
Shank, Chris	Staff, U.S. House of Representatives Science Committee

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LIST OF PRESENTATION MATERIAL¹

1. Frank Schowengerdt, *SPD Status Briefing to the CAS, October 22, 2003.*
2. Sherwood Anderson, *HDMAX Space Camera System: Preliminary Design Review.*
3. Mark Nall, *Status and Summary of the BAH Review.*
4. Bruce Lambing, *Compliments, Recommendations, and Criticisms from the Booz-Allen Hamilton Interim Report on the Office of Space Product Development.*
5. Rachel Potter and Bruce Lambing, *Evaluation of Abilities and Management: The Booz Allen and Hamilton Review Findings Report from the Independent Review of Research Partnership Center, August 4, 2003.*
6. Budget detail from the President's Budget Submission for FY 2004, Space Product Development break-out (1 page) and Research Partnerships and Flight Support breakout (1 page).
7. Excerpts from the *International Space Station Research Institute (ISSRI) Statement of Work*. Draft for External Review, September 9, 2003.

¹ Presentation and other materials distributed at the meeting are on file at NASA Headquarters, Office of Biological and Physical Research, Washington, DC 20546.